



Rocky Flats Environmental Technology Site

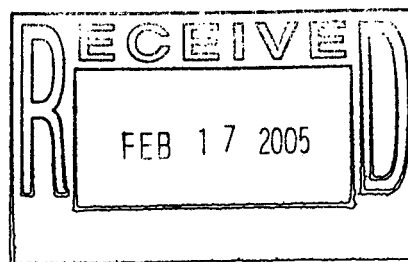
PRE-DEMOLITION SURVEY REPORT (PDSR)

**Building 775 (Sanitary Lift Station)
Concrete Pads (Diesel Tanks and B716)**

REVISION 0

July 7, 2004

**CLASSIFICATION REVIEW NOT REQUIRED PER
EXEMPTION NUMBER CEX-005-02**



ADMIN RECORD

B771-A-000282

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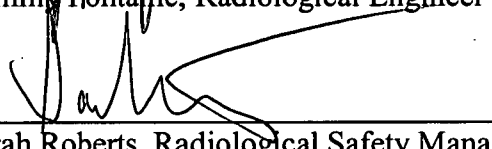
July 7, 2004

Prepared by:


Tommy Fontaine, Radiological Engineer

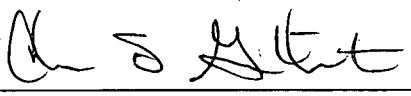
Date: 7/7/04

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos Containing Material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
DCGL _{EMC}	Derived Concentration Guideline Level – elevated measurement comparison
DCGL _W	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
PDSR	Pre-demolition survey report
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSOP	RFCA Standard Operating Protocol
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure

TSA	Total surface activity
VOCs	Volatile organic compounds
WSRIC	Waste Stream and Residue Identification and Characterization

EXECUTIVE SUMMARY

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of Building 775 (Building 771 Sanitary Lift Station), and three exterior concrete pads (under Building 716 and Tank 21-A, and over Diesel UST Tanks 192 and 193) (referred to herein as B716 pad and Diesel Tank Pads). Because these structures/pads will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Structural surfaces characterized as part of this PDS include the interior and exterior surfaces of the concrete structure over Building 775, and the exposed surfaces of the B716 and Diesel Tank concrete pads.

The PDS encompassed both chemical and radiological characterization. The characterization was built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*.

Based upon the results of this PDSR, Building 775 and the B716/Diesel Tank pads meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan. These structures can be demolished and the waste managed as PCB Bulk Product waste or as sanitary waste, and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete.

1 INTRODUCTION

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of Building 775 (Building 771 Sanitary Lift Station), and three exterior concrete pads (under Building 716 and Tank 21-A, and over Diesel UST Tanks 192 and 193) (referred to herein as B716 pad and Diesel Tank Pads). Because these Type 1 and 2 areas will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). The results of this survey shall demonstrate that Building 775 and the B716 and Diesel Tank pads meet the unrestricted release limits specified in the site Pre-Demolition Survey Plan. Structural surfaces characterized as part of this PDS include the interior and exterior surfaces of the concrete structure over Building 775, and the exposed surfaces of the B716 and Diesel Tank concrete pads.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these is Building 775 and the B716/Diesel Tank pads. These areas no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before these Type 1 and 2 areas can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Building 775 and the B716 and Diesel Tank pads. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.

1.1 PURPOSE

The purpose of this report is to communicate and document the results of the Building 775 and B716/Diesel Tank pads PDS effort. A PDS is performed prior to building demolition to define the pre-demolition radiological and chemical conditions of a facility. The pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 SCOPE

This report presents the pre-demolition radiological and chemical conditions of the Building 775 and the B716/Diesel Tank pads surfaces that will be free-released and disposed of as sanitary waste, recycle metal, or used as backfill per the requirements of the *RFETS, RFCA RSOP for Recycling Concrete*.

1.3 DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQOs) used in designing this PDS meet the minimum requirements specified in Section 2.0 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

1.3.1 The Problem

The problem involves determining whether or not the survey unit is suitable for unrestricted release in accordance with this plan.

1.3.2 The Decision

The decision is verification that objectives specified in the decommissioning decision document have been met (e.g., certain materials meet unrestricted release criteria for radiological and non-radiological constituents).

1.3.3 Inputs to the Decision

Inputs to the decision include the magnitude and location of data from preceding characterizations, including RLC and In-Process Characterization (IPC), PDS results, decision document action levels, and unrestricted release criteria.

1.3.4 Decision Boundaries

The decision boundaries are the spatial confines of the facility, including rooms and sets of rooms, in two and three dimensions. Interior and exterior surfaces are included, including those below grade. Boundaries may be further defined in RFCA decision documents.

1.3.5 Decision Rules

The following are decision rules to be used during PDS:

1.3.5.1 Radionuclides

If all radiological survey and scan measurements (and sample measurements, where sample activity is translated to surface activity as described in Section 7.2.3 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP)), are below the surface contamination guidelines specified in the Site PDSP, then the related areas and/or volume are considered not radiologically contaminated. The media sample result is calculated by converting volumetric activity (typically reported in pCi/g) to surface activity (dpm/100 cm²). The volumetric result (pCi/g) is multiplied by the weight of the sample (grams) and by 2.22 (conversion from pCi to dpm).

If any radiological survey or scan measurement exceeds the surface contamination guidelines provided in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP), the related survey unit must be evaluated per the statistical tests described in section 7.0, Data Analysis and Quality Assessment, of this plan. If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the related volume of material is considered transuranic (TRU) waste.

1.3.5.2 Hazardous Waste

If decommissioning waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Parts 261 and 268.

1.3.5.3 Hazardous Substances

If material contains a listed hazardous substance above a decision document action level (e.g., RFCA) and/or the CERCLA reportable quantity (40 CFR 302.4), the material is subject to CERCLA regulation (i.e., remediation and/or notification requirements).

1.3.5.4 Beryllium

If surface concentrations of beryllium are equal to or greater than $0.2 \mu\text{g}/100 \text{ cm}^2$, the material is considered beryllium contaminated per 10 CFR 850.

1.3.5.5 PCBs

If material contains PCBs, in a non-liquid state, from the manufacturing process at concentrations ≥ 50 ppm, the material is considered PCB Bulk Product Waste and subject to the requirements of 40 CFR 761.

If PCB contamination from a past spill/release is suspected, or if a PCB spill is discovered that has not been cleaned up, the associated material is considered PCB Remediation Waste and subject to the requirements of 40 CFR 761. PCB remediation waste includes: materials disposed of prior to April 18, 1978, that are currently at concentrations ≥ 50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCBs beginning on April 18, 1978, or ≥ 50 ppm PCBs beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under 40 CFR 761.

If a waste or item contains PCBs in regulated concentrations, the waste or item is classified as PCB-regulated material and subject to the requirements of 40 CFR 761.

1.3.5.6 Asbestos

If any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., $>1\%$ by volume), then material is considered ACM (40 CFR 763 and 5 CCR 1001-10).

1.3.6 Tolerable Limits on Decision Error

Acceptable false negative (*a*) errors for calculating the number of samples generally range from 1% to 10%. The default value specified by the Site PDSP is 5%, which was assumed for the survey design in this report.

1.3.7 Optimization of Plan Design

Statistically based radiological surveying and sampling will be conducted per the guidance in Appendix B of the RFETS Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to Section 4.0 of the PDSP for direction of characterization of non-radiological, chemical constituents. For this report, the minimum number of measurement locations is fifteen per survey unit, as calculated based on the guidance in MAN-127-PDSP. The DCGL_w is 100 dpm/100 cm² for TSA and media measurements/samples, and 20 dpm/100 cm² for RSA measurements. The LBGR was adjusted to obtain a relative shift of two. The estimated standard deviation for each measurement type was calculated based on an assumed coefficient of variation of 30%.

The scan requirements for specific survey unit classifications are as follows:

Class 3: 1-10% of Total Surface Area

No Class 1 or 2 survey units are included in the scope of this report.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Hazards Characterization Report was conducted to understand the facility history and related hazards. The Building 771 Hazards Characterization was performed in June 2001 (Refer *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0). Based on the characterization results, no radiological contamination was identified on Building 775 and the B716/Diesel Tank pads. However, B775 is considered a Type 2 facility based on the potential for contamination inside the tank.

The areas included in the scope of this PDSR are Building 775 and the B716/Diesel Tank pads.

Building 775 is an inactive sewage lift station for the Building 771 Cluster sewage system. It was installed in 1953, and is covered by a 6 feet long x 9 feet wide and 6 feet high reinforced concrete structure. The system was designed to lift the sewage up the hill into the gravity drain system to the sewage treatment facility. The tank is concrete and has a 2,000 gallon capacity. The walls of the building inside and out are not painted. The ceiling of the building is the underside of the roof slab and is not painted.

Building 716 was a containerized emergency diesel generator for Buildings 771 and 774. The container has been removed and only the concrete pad remains.

Tanks 21-A (above ground diesel storage tank) has been removed and only the concrete pad remains.

Tanks 192 and 193 (underground diesel storage tanks) remain in place and are covered with a concrete pad. The tanks will be dispositioned as radioactive material unless an adequate survey can be performed upon removal to verify the absence of radioactive

contamination in excess of the unrestricted release limits. Only the pad is included in the scope of this report.

Building 775, the Building 716 pad, and the diesel tank pads (771020 and 771107) are classified as Class 3 survey units based on the low contamination potential, per Section 3.0 of the PDSP.

The hazards characterization results and historical review (refer to Attachment E) were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. Characterization documentation is located in the Building 771 Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 775 and the B716/Diesel Tank pads were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces.

Measurements were performed to evaluate the contaminants of concern (weapons-grade plutonium isotopes). Based upon a review of the characterization data, historical and process knowledge, in-process survey data, building walk-downs, and the Site Pre-Demolition Survey Plan (MAN-127-PDSP), a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to survey packages 771020 and 771107). A Survey Unit Overview Map is presented in Attachment A. Based on hazard characterization data and historical and process knowledge, transuranic isotopes are the primary contaminants of concern in Buildings 771/774. Therefore, the PDS was performed to the transuranic PDS unrestricted release criteria. Individual radiological survey unit packages are maintained in the Building 771 Characterization Project files.

The Building 775 and the B716/Diesel Tank pads survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA) and removable surface activity (RSA) measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

Per the reference procedures, the required number of measurement locations is fifteen (15) per 1000 square-meters of floor area for Class 3 survey units. Scans were required on 1-10% of the structural surfaces.

Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachments B and C, *Radiological Data Summary and Survey Maps*.

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Building 775, Sanitary Lift Station – (Survey Unit 771020)

Building 775, the Sanitary Lift Station, is classified as a Class 3 survey unit. The classification was based on the very low potential for contamination based on process history and characterization data. A total of 15 random TSA and RSA measurements were collected. Surface scans of 14 m² (22% of total surface area) were performed.

A sample of the residual water in the tank was collected by the Environmental Restoration group. The result was less than the action levels for remedial action. Therefore, the sanitary lines that exist at a depth greater than 3.5' below final grade were flushed and grouted and will remain in place. All sanitary lines within 3.5' of final grade will be removed during building demolition.

All scans, surveys, and media sample results in survey unit 771020 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771020 are presented in Attachment B, *Survey Unit 771020 Radiological Data Summary and Survey Map*.

B716 and Diesel Tank Concrete Pads – (Survey Unit 771107)

The concrete pads under the former Building 716, under Tank 21-A, and over diesel USTs 192 and 193 were classified as a Class 3 survey unit. The classification was based on the very low potential for contamination based on process history and characterization data. A total of 15 random TSA and RSA measurements were collected. Surface scans of 89 m² (100% of total surface area) were performed.

All scans, surveys, and media sample results in survey unit 771107 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771107 are presented in Attachment C, *Survey Unit 771107 Radiological Data Summary and Survey Map*.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Based on a thorough review of historical and process knowledge, visual inspections, and personnel interviews, no additional chemical hazard sampling requirements were identified.

4.1 Asbestos

Asbestos containing building material is not present on Building 775 or the concrete pads.

4.2 Beryllium (Be)

Building 775 and the concrete pads have never been posted/controlled as Beryllium areas. Beryllium was not identified as a potential hazards in Table 4-1 of the *Reconnaissance Level Characterization Report Supplement, 771 Closure Project* in

Building 775 or the B716 or Diesel Tank pads. Therefore, no additional Beryllium samples were collected in these areas.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based upon the *B771 and B774 Hazards Characterization Report, 771 Closure Project*, Revision 0, dated June 12, 2001, personnel interviews, facility walk-downs, and historical process knowledge (WSRIC/WEMS), Building 775 did not contain hazardous waste storage units. The B716 container housed a diesel generator, and the Diesel Tank pads supported diesel tanks. A visual inspection of the building by 771/774 Industrial Hygiene personnel verified the absence of hazardous waste residuals and/or stains on the concrete slabs, therefore no additional sampling was performed for residual oils. As a result of these observances, it has been determined that no sampling for other RCRA/CERCLA constituents is required. The concrete generated from the demolition of the areas included in the scope of this report can be used for onsite recycling in accordance with the Concrete Recycling RSOP.

4.4 Polychlorinated Biphenyls (PCBs)

Free-flowing PCBs were never used/transferred in these areas. In addition, none of the surfaces in Building 775 or the Building 716 and Diesel Tank concrete pads are painted. Therefore, PCBs are not a contaminant of concern for these survey units.

5 PHYSICAL HAZARDS

Physical hazards associated with Building 775 and the concrete pads are common to standard industrial environments. The tank under Building 775 is considered a confined space and cannot be readily accessed. There are no other unique hazards associated with these areas.

Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Building 775 and the B716 and Diesel Tank pads, and consequent waste management, is of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to MAN-127-PDSP, Pre-Demolition Survey Plan for D&D Facilities, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ♦ the *number* of samples and surveys;

- ♦ the *types* of samples and surveys;
- ♦ the sampling/survey process as implemented "in the field"; and
- ♦ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are presented in Attachment D. The DQA Checklists are provided in the individual survey unit packages (located in the Building 771 Characterization Files).

The Minimum Detectable Activity (MDA) for each PDS instrument was determined *a priori* based on typical parameters (background, efficiency, and count time). A list of radiological field instrumentation and associated sensitivities is presented in Table 1.

Table 1
PDS Radiological Field Instrumentation and Minimum Detectable Activities

Model	Measurement Type	MDA (dpm/100 cm ²)
NE Electra DP6	TSA	48
Eberline SAC-4	Removable (Smears)	10
NE Electra AP6	Scans	300

7 DECOMMISSIONING WASTE TYPES

The demolition and disposal of the Building 775 and the B716 and Diesel Tank pads will generate concrete that can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete.

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 775 is classified as an RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). The Building 716 and Diesel Tank pads are classified as Type 3 areas. Based upon the results of this PDSR, Building 775 and the Building 716 and Diesel Tank pads meet the unrestricted release limits specified in the site Pre-Demolition Survey Plan and are ready for demolition. The PDS was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria.

A facility walkdown and historical review indicates that no RCRA/CERCLA constituents exist in Building 775 and the Building 716 and Diesel Tank pads (refer to Attachment E, Historical Review).

Radiological contamination in excess of the PDSP Table 7-1 limits was not detected in Building 775 and the Building 716 and Diesel Tank pads. The applicable limits are as follows:

Table 2
PDSP Table 7-1 Surface Contamination Limits

Radionuclides	Total Average (dpm/100 cm ²) ⁽¹⁾	Total Maximum (dpm/100 cm ²) ⁽²⁾	Removable (dpm/100 cm ²)
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14

	(DCGL _w)	(DCGL _{EMC})	(DCGL _w)
Transuranics	100	300	20

- (1) Measurements of average contamination should not be averaged over an area of more than 1 m².
- (2) The maximum contamination level applies to an area of not more than 100 cm².

Based upon this PDSR, Building 775 and the Building 716 and Diesel Tank pads can be demolished and the waste managed as sanitary, metal can be recycled, and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete.

To ensure that the facility remains free of contamination and that PDS data remain valid, Level 2 isolation controls have been established.

9 REFERENCES

B771 and B774 Hazards Characterization Report for the 771 Closure Project, dated June 12, 2001, Revision 0.

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

DOE Order 414.1A, *Quality Assurance*

EPA, 1994. *The Data Quality Objective Process*, EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 2, March 10, 2003.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

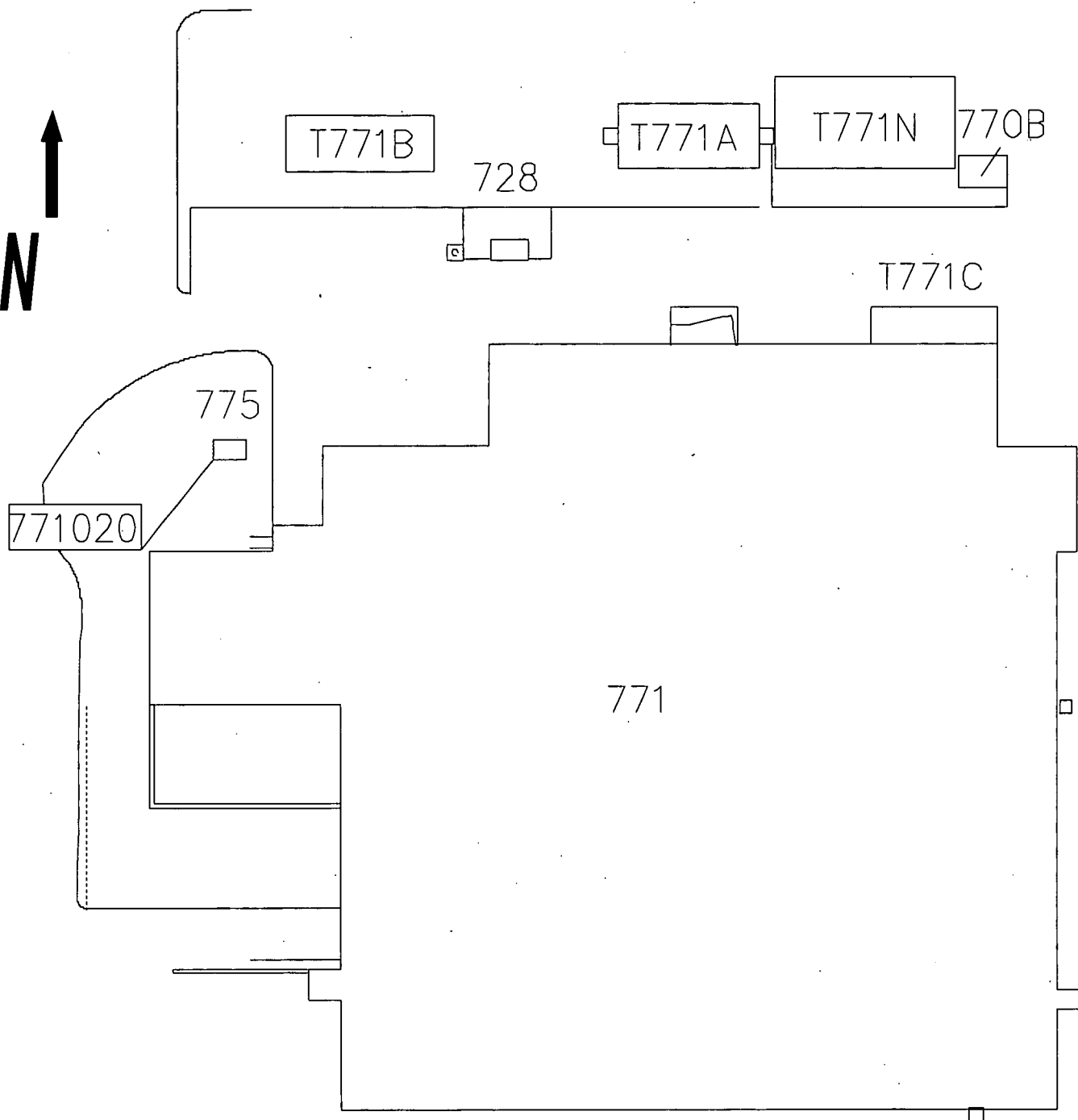
RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999

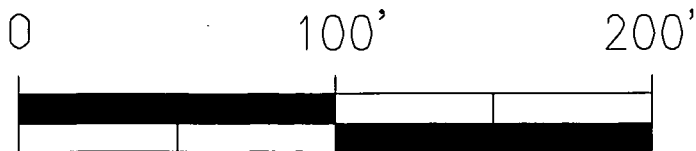
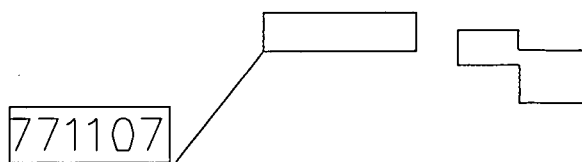
ATTACHMENT A

Survey Unit Overview Map

N ↑



Type I Pads



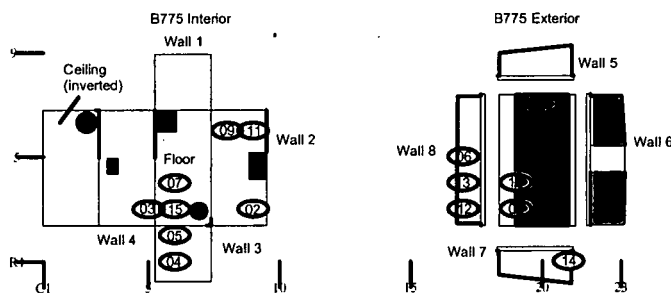
ATTACHMENT B

Survey Unit 771020
Radiological Data Summary and Survey Map

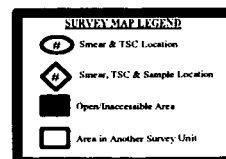
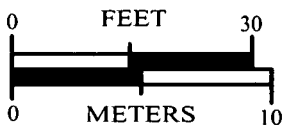
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AJ Survey Unit: 771020 Classification: 3
 Building: B775
 Survey Unit Description: Exterior/Interior
 Total Floor Area: 9 sq. m Total Area: 64 sq. m Grid Size: NA

SURVEY UNIT 771020 - MAP 1 OF 1



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Survey Area: AJ**Survey Unit:** 771020**Building:** 771**Description:** Bldg 775 Sanitary Lift Station

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

Alpha

Maximum: 94.1 dpm/100cm²Minimum: 0.0 dpm/100cm²Mean: 38.5 dpm/100cm²

Standard Deviation: 32.6

QC Maximum: 97.7 dpm/100cm²QC Minimum: 8.4 dpm/100cm²QC Mean: 53.1 dpm/100cm²Transuranic DCGL_W: 100.0 dpm/100cm²Transuranic DCGL_{EMC}: 300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Alpha

Maximum: 4.9 dpm/100cm²Minimum: -1.2 dpm/100cm²Mean: -0.2 dpm/100cm²

Standard Deviation: 1.5

Transuranic DCGL_W: 20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: AJ	Survey Unit: 771020	Building: 771									
Description: Bldg 775 Sanitary Lift Station											
Instrument Data Sheet											
Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	515011	06/23/04	Electra	1262	DP-6	11/24/04	0.220	NA	48.0	NA	T
2	515011	06/23/04	Electra	1552	DP-6	08/12/04	0.232	NA	48.0	NA	T/Q
3	515011	06/23/04	SAC-4	1491	NA	09/17/04	0.330	NA	NA	NA	R
4	515011	06/23/04	SAC-4	1178	NA	09/17/04	0.330	NA	NA	NA	R
5	515011	06/23/04	SAC-4	1410	NA	10/31/04	0.330	NA	NA	NA	R
7	515011	06/24/04	Electra	2372	DP-6	09/01/04	0.217	NA	48.0	NA	T/I

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

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Survey Area: AJ**Survey Unit:** 771020**Building:** 771**Description:** Bldg 775 Sanitary Lift Station

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771020PRP-N001	3	-0.9	N/A	
771020PRP-N002	4	-0.9	N/A	
771020PRP-N003	3	0.6	N/A	
771020PRP-N004	4	-0.9	N/A	
771020PRP-N005	5	-1.2	N/A	
771020PRP-N006	3	-0.9	N/A	
771020PRP-N007	4	-0.9	N/A	
771020PRP-N008	3	-0.9	N/A	
771020PRP-N009	4	-0.9	N/A	
771020PRP-N010	3	-0.9	N/A	
771020PRP-N011	5	4.9	N/A	
771020PRP-N012	4	-0.9	N/A	
771020PRP-N013	5	0.3	N/A	
771020PRP-N014	5	0.3	N/A	
771020PRP-N015	5	0.3	N/A	

Comments:

Survey Area: AJ**Survey Unit:** 771020**Building:** 771**Description:** Bldg 775 Sanitary Lift Station**Random/QC Total Surface Activity Data Sheet**

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771020QRP-N001	2	97.7	N/A	
771020IRP-N001	7	64.5	N/A	
771020PRP-N002	1	21.3	N/A	
771020PRP-N003	1	3.2	N/A	
771020QRP-N003	2	8.4	N/A	
771020PRP-N004	1	24.1	N/A	
771020PRP-N005	1	-0.0	N/A	
771020PRP-N006	1	57.7	N/A	
771020PRP-N007	1	12.3	N/A	
771020PRP-N008	1	90.9	N/A	
771020PRP-N009	1	12.3	N/A	
771020IRP-N010	7	61.3	N/A	
771020PRP-N011	1	9.1	N/A	
771020PRP-N012	1	94.1	N/A	
771020PRP-N013	1	60.4	N/A	
771020PRP-N014	1	60.4	N/A	
771020PRP-N015	1	5.9	N/A	

Comments:

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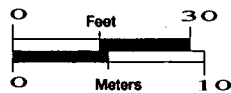
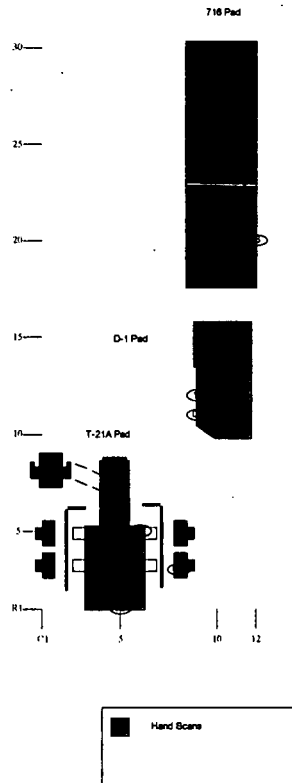
ATTACHMENT C

Survey Unit 771107
Radiological Data Summary and Survey Map

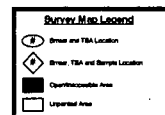
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AJ Survey Unit: 771107 Classification: 3
 Building: 771
 Survey Unit Description: Pads for 716, D-1 and T-21A
 Total Floor Area: 81 sq. m Total Area: 89 sq. m Grid Size: N/A

SURVEY UNIT 771107 - MAP 1 OF 1



N →



Survey Area: AJ**Survey Unit:** 771107**Building:** 771**Description:** Concrete pads 716, D-1 and T-21A.

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

Alpha

Maximum: 86.8 dpm/100cm²Minimum: 4.9 dpm/100cm²Mean: 37.7 dpm/100cm²

Standard Deviation: 21.4

QC Maximum: 21.3 dpm/100cm²QC Minimum: 12.3 dpm/100cm²QC Mean: 16.8 dpm/100cm²Transuranic DCGL_w: 100.0 dpm/100cm²Transuranic DCGL_{EMC}: 300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Alpha

Maximum: 3.6 dpm/100cm²Minimum: -0.9 dpm/100cm²Mean: 0.5 dpm/100cm²

Standard Deviation: 1.5

Transuranic DCGL_w: 20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: AJ	Survey Unit: 771107	Building: 771
Description: Concrete pads 716, D-1 and T-21A.		

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	514177	06/23/04	Electra	1552	DP-6	08/12/04	0.232	NA	48.0	NA	T
2	515011	06/23/04	Electra	1262	DP-6	11/24/04	0.220	NA	48.0	NA	T/Q
3	514177	06/23/04	SAC-4	1178	NA	09/11/04	0.330	NA	10.0	NA	R
4	514177	06/23/04	SAC-4	1410	NA	10/13/04	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

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Survey Area: AJ**Survey Unit:** 771107**Building:** 771**Description:** Concrete pads 716, D-1 and T-21A.**Random Removable Surface Activity Data Sheet**

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771107PRP-N001	3	-0.9	N/A	
771107PRP-N002	4	0.9	N/A	
771107PRP-N003	3	-0.9	N/A	
771107PRP-N004	4	-0.6	N/A	
771107PRP-N005	3	-0.9	N/A	
771107PRP-N006	4	2.4	N/A	
771107PRP-N007	3	0.6	N/A	
771107PRP-N008	4	0.9	N/A	
771107PRP-N009	3	3.6	N/A	
771107PRP-N010	4	-0.6	N/A	
771107PRP-N011	3	2.1	N/A	
771107PRP-N012	4	0.9	N/A	
771107PRP-N013	3	-0.9	N/A	
771107PRP-N014	4	2.4	N/A	
771107PRP-N015	3	-0.9	N/A	

Comments:

Survey Area: AJ**Survey Unit:** 771107**Building:** 771**Description:** Concrete pads 716, D-1 and T-21A.

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771107PRP-N001	1	36.4	N/A	
771107QRP-N001	2	12.3	N/A	
771107PRP-N002	1	6.2	N/A	
771107QRP-N002	2	21.3	N/A	
771107PRP-N003	1	59.7	N/A	
771107PRP-N004	1	4.9	N/A	
771107PRP-N005	1	48.0	N/A	
771107PRP-N006	1	16.6	N/A	
771107PRP-N007	1	30.8	N/A	
771107PRP-N008	1	45.0	N/A	
771107PRP-N009	1	33.8	N/A	
771107PRP-N010	1	22.2	N/A	
771107PRP-N011	1	53.6	N/A	
771107PRP-N012	1	48.0	N/A	
771107PRP-N013	1	45.0	N/A	
771107PRP-N014	1	86.8	N/A	
771107PRP-N015	1	27.8	N/A	

Comments:

ATTACHMENT D

Data Quality Assessment

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1. A data completeness summary for all results is given in Table E-2.

All relevant Quality records supporting this report are maintained in the B771 Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic DCGL_w (100 dpm/100cm²).

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied site PDSP guidance. All facility contamination levels were below applicable unrestricted release levels, except as noted above. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits.

Level 2 Isolation Controls have been implemented to prevent the inadvertent introduction of further contamination into the facility. On this basis, the 771020 and 771107 packages meet the RLCP and PDSP DQO criteria with the confidences stated herein.

Table E-1 V&V of Radiological Surveys – Bldg. 775, Concrete Pads (716, D-1, T-21A)

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	initial calibrations	80%<x<120 %	≥1	Calibration using Alpha Group procedure and approved technicians.
	daily source checks	80%<x<120 %	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected Ranges <10 cpm
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥100% packages	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 771020, and 771107.	statistical	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm ²	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm ² RA: ≤10 dpm/100cm ²	all measures	MDAs ≤ ½ DCGL _w per MARSSIM guidelines.

Table E-2 Data Completeness Summary – B771, Bldg. 775, Concrete Pads (716, D-1, T-21A).

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area: AJ Survey Unit: 771020 B771 Bldg. 775 Sanitary Lift Station	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 22% scanned	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 22% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level	Transuranic DCGLs No result above action level
Radiological	Survey Area: AJ Survey Unit: 771107 B771 Concrete Pads 716, D-1, and T-21A	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 100% scanned	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 100% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level	Transuranic DCGLs No result above action level

ATTACHMENT E

Historical Review

Area AJ (Building 775 and Type 1 Concrete Pads)
Historical Review
July 2, 2004

Facility ID: Building 775 (Sanitary Lift Station), B716 and Diesel Tanks Concrete Pads
Anticipated Facility Type (1, 2, or 3): Type 2 (B775), Type 1 (B716/Diesel Tank Pads)
<p>Physical Description: Building 775 is an inactive sewage lift station for the Building 771 Cluster sewage system. It was installed in 1953, and is covered by a 6 feet long x 9 feet wide and 6 feet high reinforced concrete structure. The system was designed to lift the sewage up the hill into the gravity drain system to the sewage treatment facility. The tank is concrete and has a 2,000 capacity. The walls of the building inside and out are not painted. The ceiling of the building is the underside of the roof slab and is not painted.</p> <p>Building 716 was a containerized emergency diesel generator for Buildings 771 and 774. The container has been removed and only the concrete pad remains.</p> <p>Tanks 21-A (above ground diesel storage tank) has been removed and only the concrete pad remains.</p> <p>Tanks 192 and 193 (underground diesel storage tanks) remain in place and are covered with a concrete pad. The tanks will be dispositioned as radioactive material unless an adequate survey can be performed upon removal to verify the absence of radioactive contamination in excess of the unrestricted release limits. Only the pad is included in the scope of this report.</p>
<p>Historical Operations: See Physical Description.</p>
<p>Current Operational Status No longer operational.</p>
Contaminants of Concern
<p>Asbestos No asbestos containing material exists or existed in these areas.</p>
<p>Beryllium (Be) B775 and the concrete pads are not RFETS Beryllium (Be) Areas, based on historical and existing classifications, and historical use.</p>
<p>Lead A visual inspection of B775 and the concrete pads by 771/774 Environmental Compliance personnel verified the absence of hazardous waste residuals and/or stains on the slabs and B775 structure. No paint exists on B775 or the slab surfaces.</p>
<p>RCRA/CERCLA Constituents A visual inspection of B775 and the concrete pads by 771/774 Environmental Compliance personnel verified the absence of hazardous waste residuals and/or stains. The underground diesel tanks were washed and foamed in accordance with RFCA.</p>

Area AJ (Building 775 and Type 1 Concrete Pads)
Historical Review
July 2, 2004

PCBs Free-flowing or exposed PCBs have never been used or transferred in/on these areas.
Radiological Contaminants The contaminants of concern for the 771 project, including all areas of Buildings 771 and 774, are transuranic alpha-emitting radioisotopes (including Pu-238, Pu-239/240, Pu-242, and Am-241). Based on findings documented in Radiological Engineering TBD-00161, Rev. 0, alpha-only surveys assure that the unrestricted-release limits for any other isotopes that may exist in Building 771/774 will not be exceeded. There is no history of radiological contamination in/on these areas.
Environmental Restoration Concerns A sample of the residual water in the B775 tank was collected by the Environmental Restoration group. The result is less than the action levels for remedial action. Therefore, the sanitary lines were flushed and grouted and will remain in place. One IHSS (150.2) exists under Building 775 area. This IHSS represented a potential radiological plume that originated from the 771 and 776 fires. Characterization of the under building contamination (UBC) has been conducted for the entire 771/774 Project. Based on the preliminary results, no remedial action is anticipated.
Additional Information None
References (1) <i>B771 and B774 Hazards Characterization Report for the 771 Closure Project</i> , dated June 12, 2001, Revision 0. (2) <i>Building 771/774 Cluster Closure Project Reconnaissance Level Characterization Report</i> , dated August 8, 1998, Revision 2.
Further Actions Complete the PDS process.

Total Area (sq. m)	Scanned Area (sq. m)	Percent Scanned
64	21	33%

Floor	Scanned Area (sq. m)	Percent Scanned
9	4	44%

Lower wall interior	Scanned Area (sq. m)	Percent Scanned
18	3	17%

Upper wall interior	Scanned Area (sq. m)	Percent Scanned
2	0	0%

Ceiling	Scanned Area (sq. m)	Percent Scanned
9	0	0%

Lower wall exterior	Scanned Area (sq. m)	Percent Scanned
13	4	31%

Upper wall exterior	Scanned Area (sq. m)	Percent Scanned
13 / roof	10	77%

Report Revisions

For 771 PDSR

- ① 76' sampled by ER (soil) RCRA RAP cr.
 ② 76' sampling done For concrete

① Change 771020 to CLASS 2 survey unit → RCRA samples For sediment

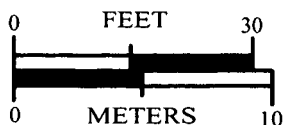
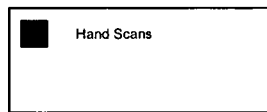
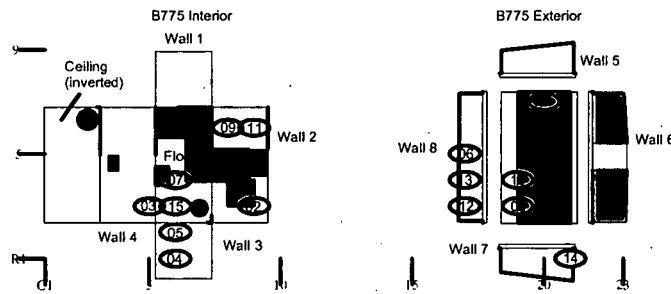
② Survey unit breakdown structure to CDPHE For 371

③ Isolation Controls For 2nd Floor

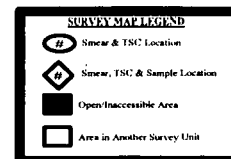
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AJ Survey Unit: 771020 Classification: 3
 Building: B775
 Survey Unit Description: Exterior/Interior
 Total Floor Area: 9 sq. m Total Area: 64 sq. m Grid Size: NA

SURVEY UNIT 771020 - MAP 1 OF 1



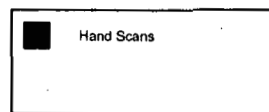
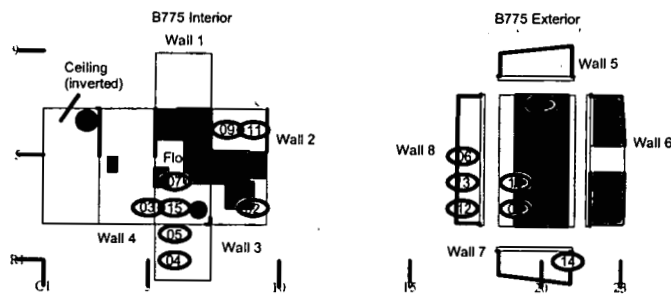
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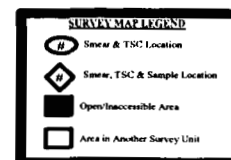
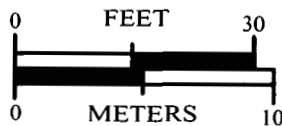
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AJ Survey Unit: 771020 Classification: 3
 Building: B775
 Survey Unit Description: Exterior/Interior
 Total Floor Area: 9 sq. m Total Area: 64 sq. m Grid Size: NA

SURVEY UNIT 771020 - MAP 1 OF 1



Best Available Copy



771020
B775

Total Area (sq. m)	Scanned Area (sq. m)	Percent Scanned
64	21	33%

Floor	Scanned Area (sq. m)	Percent Scanned
9	4	44%

Lower wall interior	Scanned Area (sq. m)	Percent Scanned
18	3	17%

Upper wall interior	Scanned Area (sq. m)	Percent Scanned
2	0	0%

Ceiling	Scanned Area (sq. m)	Percent Scanned
9	0	0%

Lower wall exterior	Scanned Area (sq. m)	Percent Scanned
13	4	31%

Upper wall exterior	Scanned Area (sq. m)	Percent Scanned
13	10	77%

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